

Claims Listing:

Claim 1 (Currently Amended). The method of making an optical fiber array comprising:

providing a first mask having a first plurality of longitudinally extending holes and a forward surface and a rear surface,

providing ~~a~~ an anodic bonding element having a first like-plurality of longitudinally extending holes,

aligning said first mask and said bonding element so that the first plurality of holes and the first like-plurality of holes are substantially longitudinally aligned, and

first anodic bonding the first mask rear surface and the bonding element together, and

securing a plurality of optical fibers in said first plurality of holes.

Claim 2 (Original). The method of Claim 1 wherein said bonding element comprises a bonding die.

Claim 3 (Original). The method of Claim 2 wherein the first mask, the bonding die and the optical fibers are formed of materials that have substantially the same coefficient of thermal expansion.

Claim 4 (Currently amended). The method of ~~Claim 3~~ making an optical fiber array comprising:

providing a first mask having a first plurality of longitudinally extending holes and a forward surface and a rear surface,

providing an anodic bonding element having a first like-plurality of longitudinally extending holes,

aligning said first mask and said bonding element so that the first plurality of holes and the first like-plurality of holes are substantially longitudinally aligned, and

first anodic bonding the first mask rear surface and the bonding element together, and

securing a plurality of optical fibers in said first plurality of holes, and wherein

said bonding element comprises a bonding die, and wherein the first mask, the bonding die and the optical fibers are formed of materials that have substantially the same coefficient of thermal expansion, and further comprising

providing a second mask having a second like-plurality of longitudinally extending holes longitudinally aligned with the first plurality of holes, and

second anodic bonding the second mask and said bonding die together, and wherein

the plurality of fibers extend through the first and second like-plurality of holes prior to and during said securing step.

Claim 5(Original). The method of Claim 4 wherein the second mask is formed of material that has substantially the same coefficient of thermal expansion as the optical fibers.

Claim 6(Currently amended). The method of ~~Claim 4~~ making an optical fiber array comprising:

providing a first mask having a first plurality of longitudinally extending holes,

providing a bonding element having a first like-plurality of longitudinally extending holes,

aligning said first mask and said bonding element so that the first plurality of holes and the first like-plurality of holes are substantially longitudinally aligned, and

first anodic bonding the first mask and the bonding element together, and

securing a plurality of optical fibers in said first plurality of holes, and wherein

said bonding element comprises a bonding die, and
wherein the first mask, the bonding die and the optical
fibers are formed of materials that have substantially the
same coefficient of thermal expansion, and further
comprising

providing a second mask having a second like-
plurality of longitudinally extending holes longitudinally
aligned with the first plurality of holes, and

second anodic bonding the second mask and said
bonding die together, and wherein

the plurality of fibers extend through the first and
second like-plurality of holes prior to and during said
securing step, and further comprising,

providing a spacer having a third like-plurality of
longitudinally extending holes substantially
longitudinally aligned with the second like-plurality of
holes,

third anodic bonding the spacer and the second mask
together, and

the plurality of fibers extend through the spacer
prior to and during said securing step.

Claim 7(Original). The method of Claim 6 wherein the
spacer is formed of material that has substantially the

same coefficient of thermal expansion as the optical fibers.

Claim 8(Original). The method of Claim 6 wherein the first mask, bonding die and second mask form at least a partial stack and the at least partial stack is heated during anodic bonding.

Claim 9(Original). The method of Claim 8 wherein first anodic bonding includes providing DC voltage of a first polarity between the front and back of the at least partial stack while the stack is heated.

Claim 10(Original). The method of Claim 9 wherein second anodic bonding includes providing DC voltage of a second polarity between the front and back of the at least partial stack while stack is heated.

Claim 11(Original). The method of Claim 10 wherein the heating of the at least partial stack maintains substantially the same at least partial stack temperature from at least the end of said first anodic bonding to at least the start of said second anodic bonding.

Claim 12(Original). The method of Claim 8 wherein the spacer is included in the at least partial stack,

said third anodic bonding step occurring at least partially during said first anodic bonding step.

Claim 13(Original). The method of Claim 8 wherein the spacer is included in the at least partial stack,

said third anodic bonding step occurring after said second anodic bonding step.

Claim 14(Original). The method of Claim 1 wherein said bonding element comprises a spacer.

Claim 15(Original). The method of Claim 1 further comprising anodic bonding the forward surface of the first mask to a glass lens array having a number of lens elements and wherein the fibers optically cooperate with the lens elements.

Claim 16. An optical fiber array comprising:

a first mask having a first plurality of longitudinally extending holes and a forward surface and a rear surface,

~~a~~ an anodic bonding element having a first like-plurality of longitudinally extending holes,

said first mask and said bonding element arranged so that the first plurality of holes and the first like-plurality of holes are substantially longitudinally aligned, and

the first mask -rear surface and the bonding element being bonded together by a layer of sodium ions and oxides of the first mask and bonding element materials, and

a plurality of optical fibers extending through the bonding element holes and secured in said first plurality of holes.

Claim 17(Original). The array of Claim 16 wherein said bonding element comprises a bonding die.

Claim 18(Original). The array of Claim 17 wherein the first mask, the bonding die and the optical fibers are formed of materials that have substantially the same coefficient of thermal expansion.

Claim 19(Original). The array of Claim 18 further comprising

a second mask having a second like-plurality of longitudinally extending holes longitudinally aligned with the first plurality of holes, and

the second mask and said bonding die being bonded together by a layer of sodium ions and oxides of the second mask and bonding die materials, and wherein

the plurality of fibers extend through said first and said second like-plurality of holes.

Claim 20(Original). The array of Claim 19 wherein the second mask is formed of material that has substantially the same coefficient of the thermal expansion as the optical fibers.

Claim 21 (Currently amended). ~~The array of Claim 19~~ An

optical fiber array comprising:

a first mask having a first plurality of longitudinally extending holes,

a bonding element having a first like-plurality of longitudinally extending holes,

said first mask and said bonding element arranged so that the first plurality of holes and the first like-plurality of holes are substantially longitudinally aligned, and

the first mask rear surface and the bonding element being bonded together by a layer of sodium ions and oxides of the first mask and bonding element materials, and

a plurality of optical fibers extending through the bonding element holes and secured in said first plurality of holes,

Said bonding element comprising a bonding die,

the first mask, the bonding die and the optical fibers being formed of materials that have substantially the same coefficient of thermal expansion.

a second mask having a second like-plurality of longitudinally extending holes longitudinally aligned with the first plurality of holes, and

the second mask and said bonding die being bonded
together by a layer of sodium ions and oxides of the
second mask and bonding die materials, and wherein
the plurality of fibers extend through said first and
said second like-plurality of holes, and wherein
the second mask is formed of material that has
substantially the same coefficient of the thermal
expansion as the optical fibers , and further comprising
a spacer having a third like-plurality of
longitudinally extending holes substantially
longitudinally aligned with the second like-plurality of
holes,

the spacer and the second mask being bonded together
by a layer of sodium ions and oxides of the second mask
and spacer materials, and

the plurality of fibers extending through the spacer
third like-plurality of holes.

Claim 22(Original). ~~The array of Claim 16 wherein~~ An
optical fiber array comprising:

a first mask having a first plurality of longitudinally
extending holes and a forward surface and a rear surface,
a an anodic bonding element having a first like-
plurality of longitudinally extending holes,

said first mask and said bonding element arranged so
that the first plurality of holes and the first like-
plurality of holes are substantially longitudinally
aligned, and

the first mask rear surface and the bonding element
being bonded together by a layer of sodium ions and oxides
of the first mask and bonding element materials, and

a plurality of optical fibers extending through the
bonding element holes and secured in said first plurality
of holes, and

wherein said bonding element comprises a spacer with a
predetermined longitudinal thickness related to a
longitudinal dimension of the front portion of the array
housing.

Claim 23 (Original). The array of Claim 16 further
comprising a glass lens array bonded to the forward
surface of said first mask by a layer of sodium ions and
oxides of the first mask and glass lens array materials,
and wherein

the fibers optically cooperate with said glass lens
array.

Claim 24 (Canceled).—~~The inventions disclosed herein.~~